FIG. 1

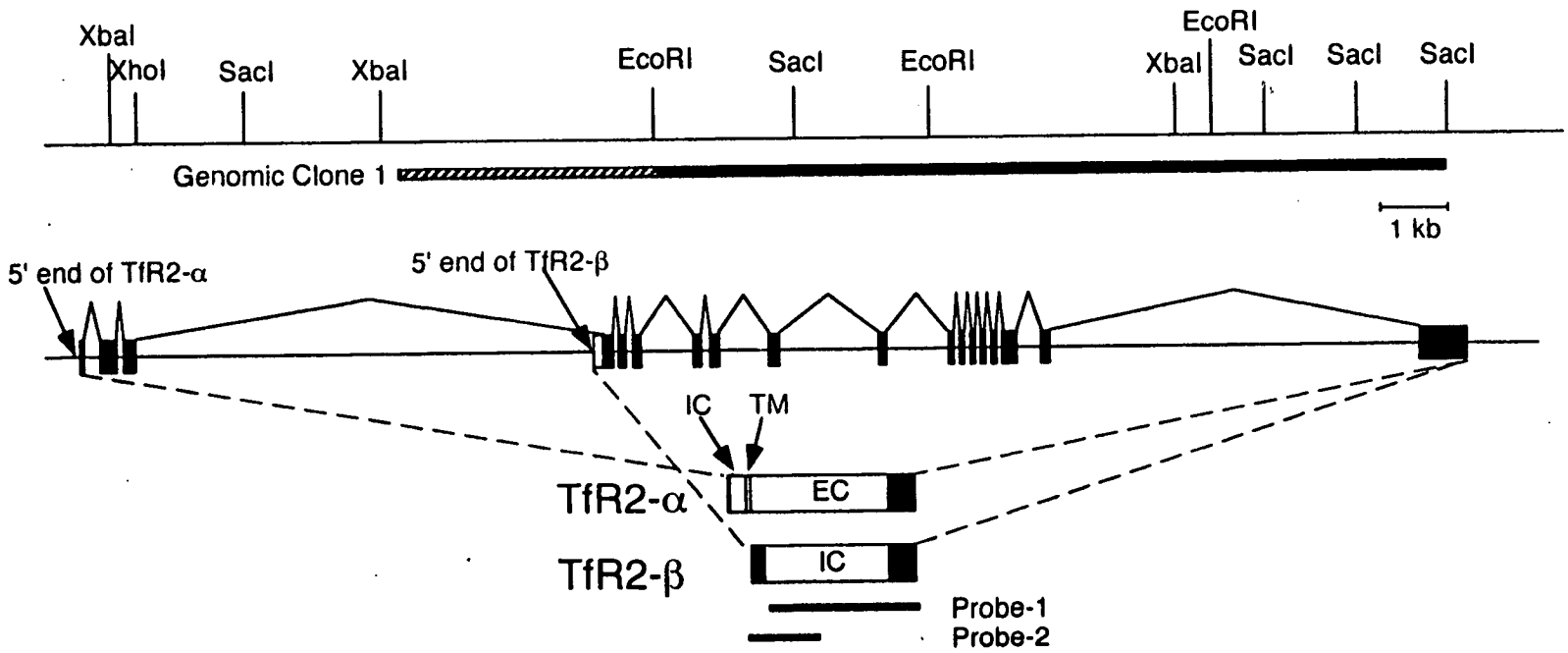
XbaI
XhoI
SacI
XbaI
EcoRI
SacI
EcoRI
XbaI
EcoRI
SacI
SacI
SacI
Genomic Clone 1
1 kb
5' end of TfR2-α
5' end of TfR2-β
IC
TM
TfR2-α
EC
TfR2-β
IC
Probe-1
Probe-2

FIG. 2

Exon 3 of TfR2-α

CCTTCCTACTGGGCTACGTCGCCTTCCGAGGGTCCTGCCAGGCGTGCGGAGACTCTGTGT

TGGTGGTCAGTGAGGATGTCAACTATGAGCCTGACCTGGATTTCCACCAGGGCAGACTCT

Primer-D

ACTGGAGCGACCTCCAGGCCATGTTCCTGCAGTTCCTGGGGGAGGGGCGCCTGGAGGACA

CCATCAG

Exon 4 (boxed sequence is in the TfR2-β only)

GCGTCCGCGGGGAGCGCTCTTTTCCTAAACTCAGGAACCCCTCGCCGCCCCTGCCCCTGG

CGACCCCACGTCTCTGGCATCCTTCCCTCTTCCCTCCCTCTCCTCCGGGCGCCCAAAAAA

Primer-C

GTCCCCACCTCTCCCCGCTTAGGCAAACCAGCCTTCGGGAACGGGTGGCAGGCTCGGCCG

GGATGGCCGCTCTGACTCAGGACATTCGCGCGGCGCTCTCCCGCCAGAAGCTGGACCACG

Primer-A

TGTGGACCGACACGCACTACGTGGGGCTGCAATTCCCGGATCC

Exon 5 (common for both α- and β-forms)

GGCTCACCCCAACACCCTGCACTGGGTCGATGAGGCCGGGAAGGTCGGAGAGCAGCTGCC

Primer-E

GCTGGAGGACCCTGACGTCTACTGCCCCTACAGCGCCATCGGCAACGTCACG

FIG. 3


TfR2-α 1 MERLWGLFQRAQQLSPRSSQTVYQRVEGPRKGHLEELEDGEEGAETLAH
TfR 1 M---MDQARSAFSNLFGGEPLSYTRFSLAR----------QVDGDNS
PSMA 1 M----------
TfR2-α 51 FCPMELRGPEPLGSRPRQPNLIPWAAAGRRAAPYLVLTALLIFTGAFLLG
TfR 35 HVEMKLAVDEEENADNNTKANVTKPKRCSGSICYGTIAVIVFFLIGFMIG
PSMA 2 ----------WNLLHETDSAVATARRPRWLCAGALVLAGGFFLLG
TfR2-α 101 YVAF-RGSC-QACGDSVLVVSEDVNYEPDLDFHQGR-LYWSDLQAMFLQF
TfR 85 YLGYCKGVEPKTECERLAGTESPVREEPGEDFPAARRLYWDDLKRKLSEK
PSMA 37 FLF---GWFIKSSNEATNITPKHNMKA----------F
TfR2-α 148 LGEGRLEDTIR---QTSLRERVAGSAGMAALTQDIRAALSRQKLDHVWTD
TfR 135 LDSTDFTSTIKLLNENSYVPREAGSQKDENLALYVENQFREFKLSKVWRD
PSMA 62 LDELKAENIKKFLYNFTQIPHLAGTEQNFQLAKQIQSQWKEFGLDSVELA
TfR2-α 195 THYVGLQF-PDPAHPNTLHWVDEAGKVGEQ--LPLEDPDVYCPYSAIGNV
TfR 185 QHFVKIQV-KDSA-QNSVIIVDKNGRLVY---LVENPGGYVAYSKAATV
PSMA 112 -HYDVLLSYPNKTHPNYISIINEDGNEIFNTSLFEPPPPGYENVSDIVPP
TfR2-α 242 T----------GELVYAHYGRPEDLQDLRARGVDPV-GRLLLVRVGVISF
TfR 229 T----------GKLVHANFGTKKDFEDL----YTPVNGSIVIVRAGKITF
PSMA 161 FSAFSPQGMPEGDLVYVNYARTEDFFKLERDMKINCSGKIVIARYGKVFR
TfR2-α 281 AQKVTNAQDFGAQGVLIYPEPAD-FSQDPPKPSLSSQQAVYGHVH-----
TfR 265 AEKVANAESLNAIGVLIYMDQTK-FPIVNAE-----LSFFGHAH-----
PSMA 211 GNKVKNAQLAGAKGVILYSDPAD-YFAPGVKSYPDGWNLPGGGVQRGNILN
TfR2-α 325 L-GTGDPYTPGFPSFNQTQFPPVA-SSGLPSIPAQPISADIASRLLRKLK
TfR 303 L-GTGDPYTPGFPSFNHTQFPPSR-SSGLPNIPVQTISRAAAEKLFGNME
PSMA 261 LNGAGDPLTPGYPANEYAYRRGIAEAVGLPSIPVHPIGYYDAQKLLEKMG
TfR2-α 373 GPVAPQE--WQGSLLGSPYHLGPGPR--------LRLVVNNHRTSTPINN
TfR 351 GD-CPSD--WK---------TDSTCRMVTSESKNVKLTVSNVLKEIKILN
PSMA 311 GS-APPDSSWRGSLK-VPYNVGPGFTGNFSTQK-VKMHIHSTNEVTRIYN
TfR2-α 413 IFGCIEGRSEPDHYVVIGAQRDAWGPGAAKSAVGTAILLELVRTFSSMVS
TfR 389 IFGVIKGFVEPDHYVVVGAQRDAWGPGAAKSGVGTALLLKLAQMFSDMVL
PSMA 358 VIGTLRGAVEPDRYVILGGHRDSWVFGGIDPQSGAAVVHEIVRSFGTLKK
TfR2-α 463 N-GFRPRRSLLFISWDGGDFGSVGSTEWLEGYLSVLHLKAVVYVSLDNAV
TfR 439 KDGFQPSRSIIFASWSAGDFGSVGATEWLEGYLSSLHLKAFTYINLDKAV
PSMA 408 E-GWRPRRTILFASWDAEEFGLLGSTEWAEENSRLLQERGVAYINADSSI
TfR2-α 512 LGDDKFHAKTSPLLTSLIESVLKQVDSPNH--SGQTLYEQVVFTNPSWDA
TfR 489 LGTSNFKVSASPLLYTLIEKTMQNVKHPV---TGQFLYQDSNWASKV-EK
PSMA 457 EGNYTLRVDCTPLMYSLVHNLTKELKSPDEGFEGKSLYESWTKKSPSPEF
TfR2-α 560 EVIRPLPMDSSAYSFTAFV---GVP---AVEFSFMEDDQAYPFLHTKEDT
TfR 535 LTLDNAAFPFLAYS--------GIP---AVSFCFCEDTD-YPYLGTTMDT
PSMA 507 SGMPRISKLGSGNDFEVFFQRLGIASGRARYTKNWETNKFSGYPLYHSVY
TfR2-α 604 YENLHKVLQGRLPAVAQA--VAQLAGQLLIRLSHDRLLPLDFGRYGDVVL
TfR 573 YKEL-IERIPELNKVARA--AAEVAGQFVIKLTHDVELNLDYERYNSQLL
PSMA 557 ETYE-LVEKFYDPMFKYHLTVAQVRGGMVFELANSIVLPFDCRDYAVVLR
TfR2-α 652 RHIGNLNEFSGDLK-ARGLTLQWVYSARGDYIRAAEKLRQEIYSSEERDE
TfR 620 SFVRDLNQYRADIK-EMGLSLQWLYSARGDFFRATSRLTTDFGN-AEKTD
PSMA 606 KYADKIYSISMKHPQEMKTYSVSFDSLFSAVKNFTEIASKFSERLQDFDK
TfR2-α 701 RLTRMY---NVRIMRVEFYFLSQYVSPADSPF-RHIFMGRGDHTLGALLD
TfR 668 RFV-MKKL-NDRVMRVEYHFLSPYVSPKESPF-RHVFWGSGSHTLPALLE
PSMA 656 SNPIVLRMMNDQLMFLERAFIDPLGLPDR-PFYRHVIYAPSSHNKYAGES
TfR2-α 747 HLRLLRSNSSGTPGATSSTGFQESRFRRQLALLTWTLQGAANALSGDVWN
TfR 715 NLKLRKQNN--------GAFNETLFRNQLALATWTIQGAANALSGDVWD
PSMA 705 FPGIYDALFDIESKVDPSKAWGEVKR-QIYVAAFTVQAAAETLSEVAD
TfR2-α 797 IDNNF
TfR 756 IDNEF
PSMA 752 I

FIG. 4A

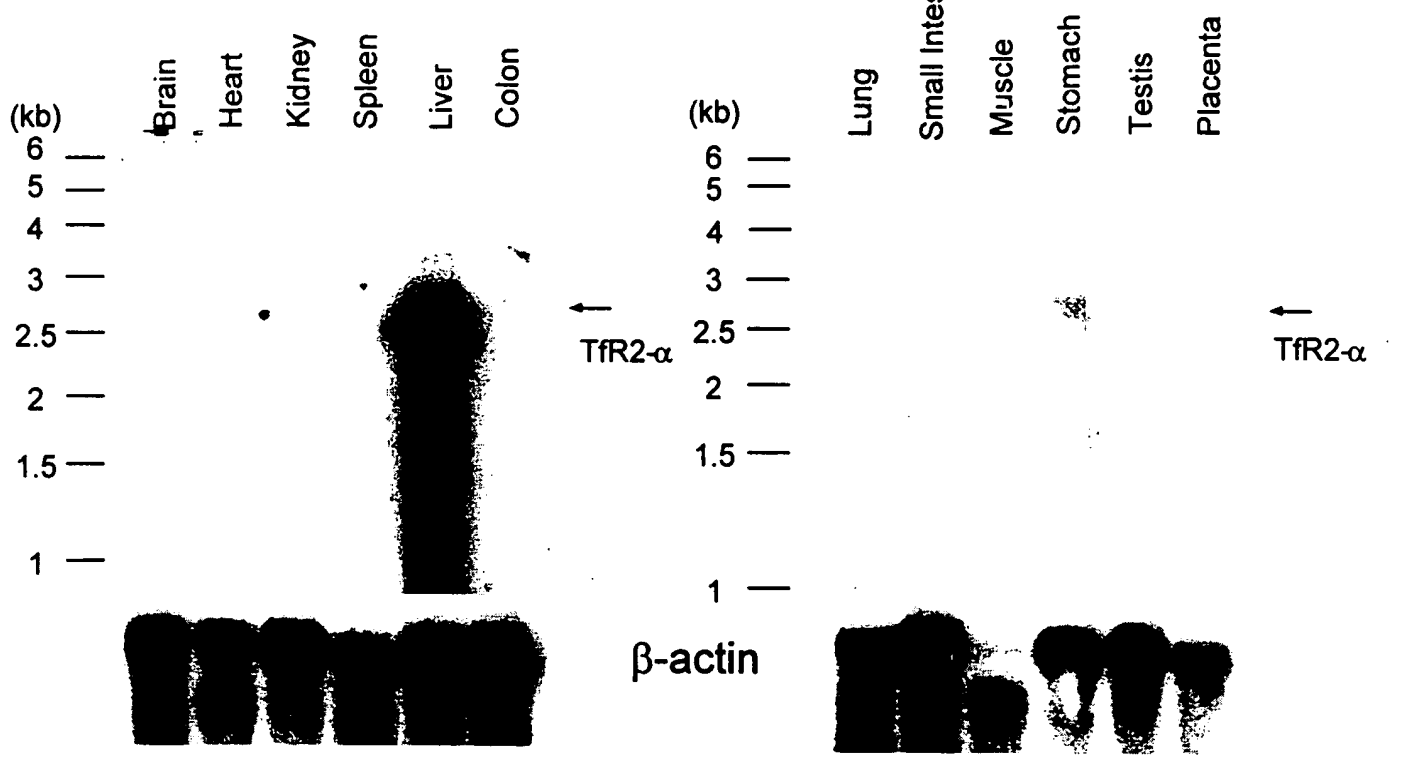
(kb)
6
5
4
3
2.5
2
1.5
1
Brain
Heart
Kidney
Spleen
Liver
Colon
TfR2-α
β-actin
(kb)
6
5
4
3
2.5
2
1.5
1
Lung
Small Intestine
Muscle
Stomach
Testis
Placenta
TfR2-α

FIG. 4B

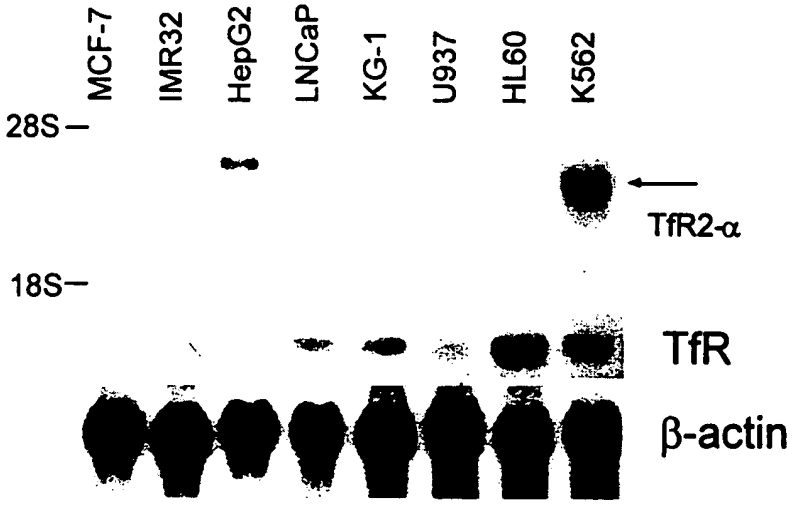
MCF-7
IMR32
HepG2
LNCaP
KG-1
U937
HL60
K562
28S
TfR2-α
18S
TfR
β-actin

FIG. 5A

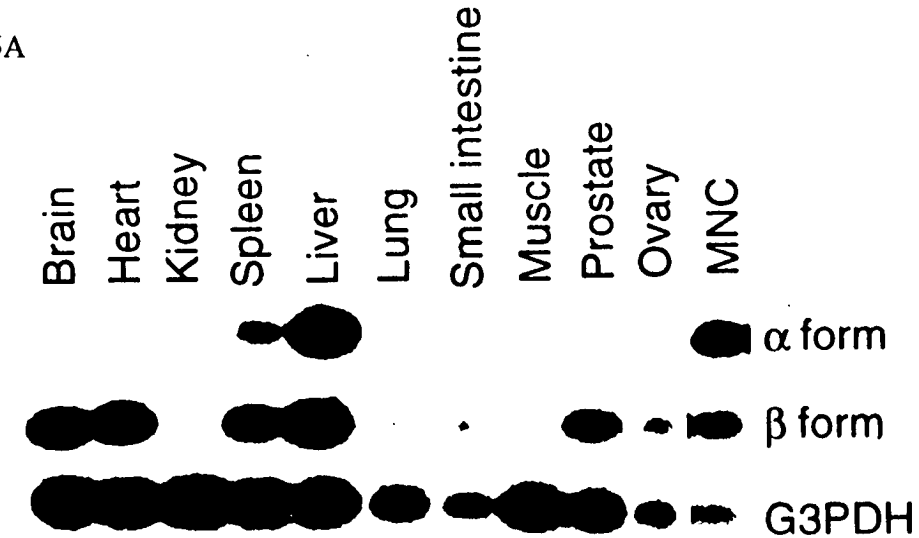
Brain
Heart
Kidney
Spleen
Liver
Lung
Small intestine
Muscle
Prostate
Ovary
MNC
α form
β form
G3PDH

FIG. 5B

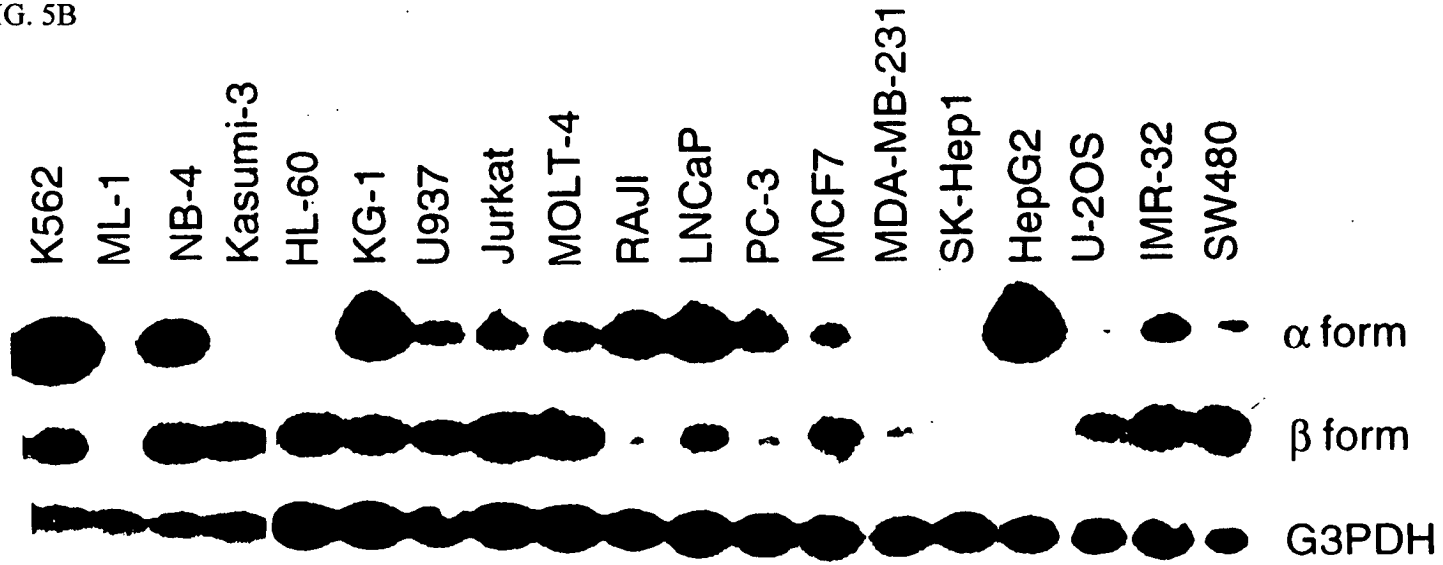
K562
ML-1
NB-4
Kasumi-3
HL-60
KG-1
U937
Jurkat
MOLT-4
RAJI
LNCaP
PC-3
MCF7
MDA-MB-231
SK-Hep1
HepG2
U-2OS
IMR-32
SW480
α form
β form
G3PDH

FIG. 6A

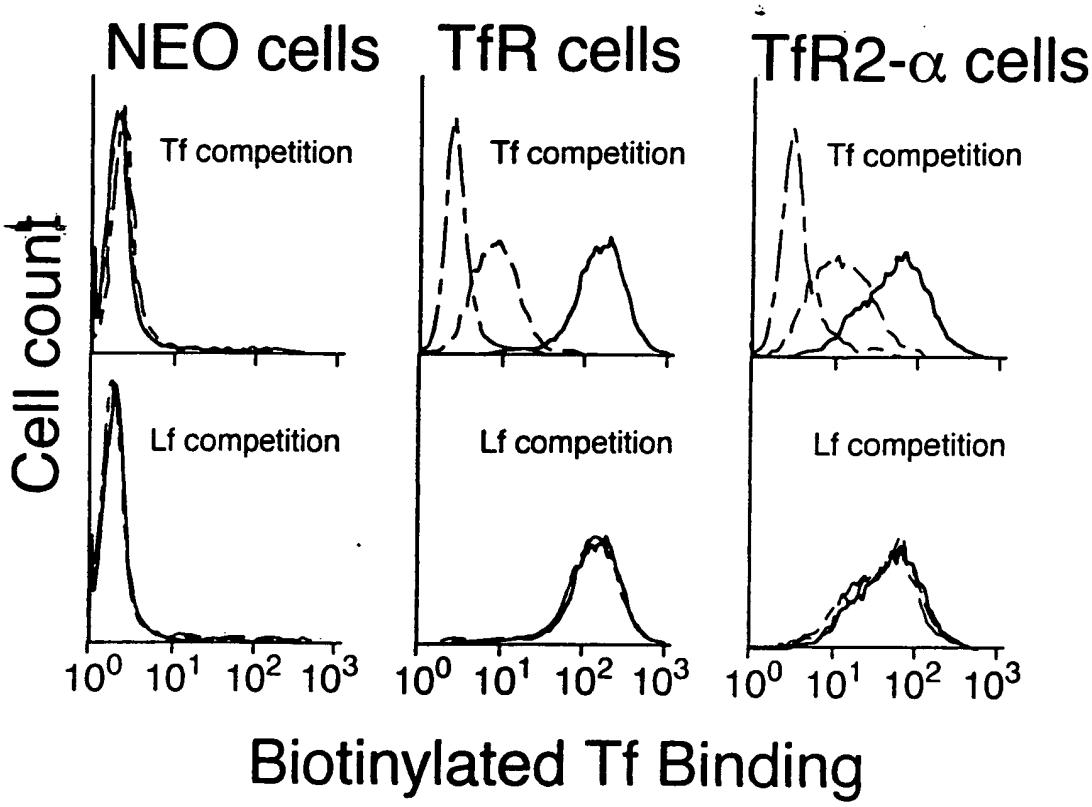
NEO cells
TfR cells
TfR2-α cells
Tf competition
Lf competition
Cell count
10^0 10^1 10^2 10^3
Biotinylated Tf Binding

FIG. 6B

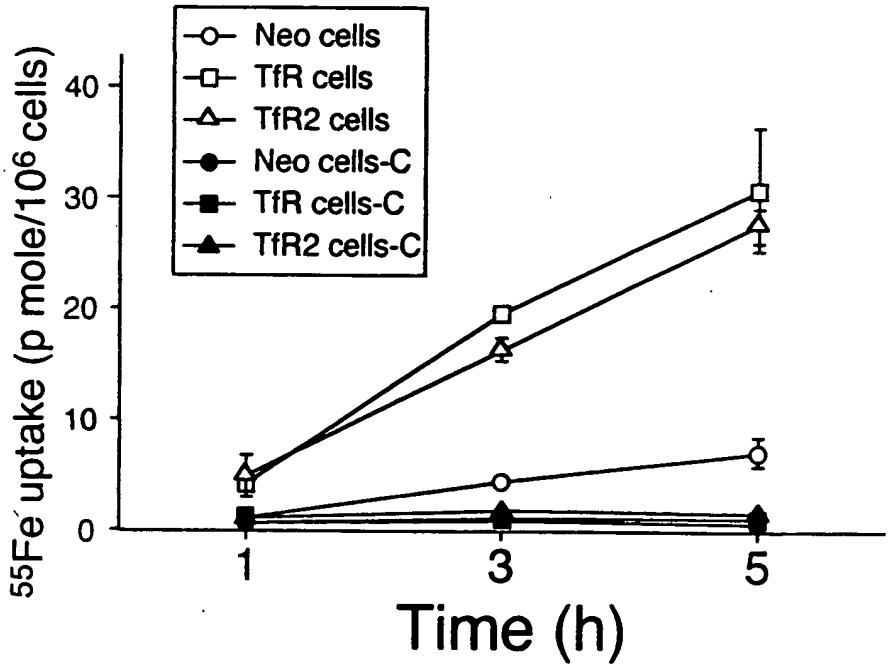
Neo cells
TfR cells
TfR2 cells
Neo cells-C
TfR cells-C
TfR2 cells-C
^{55}Fe uptake (p mole/10^6 cells)
0
10
20
30
40
1
3
5
Time (h)

FIG. 6C

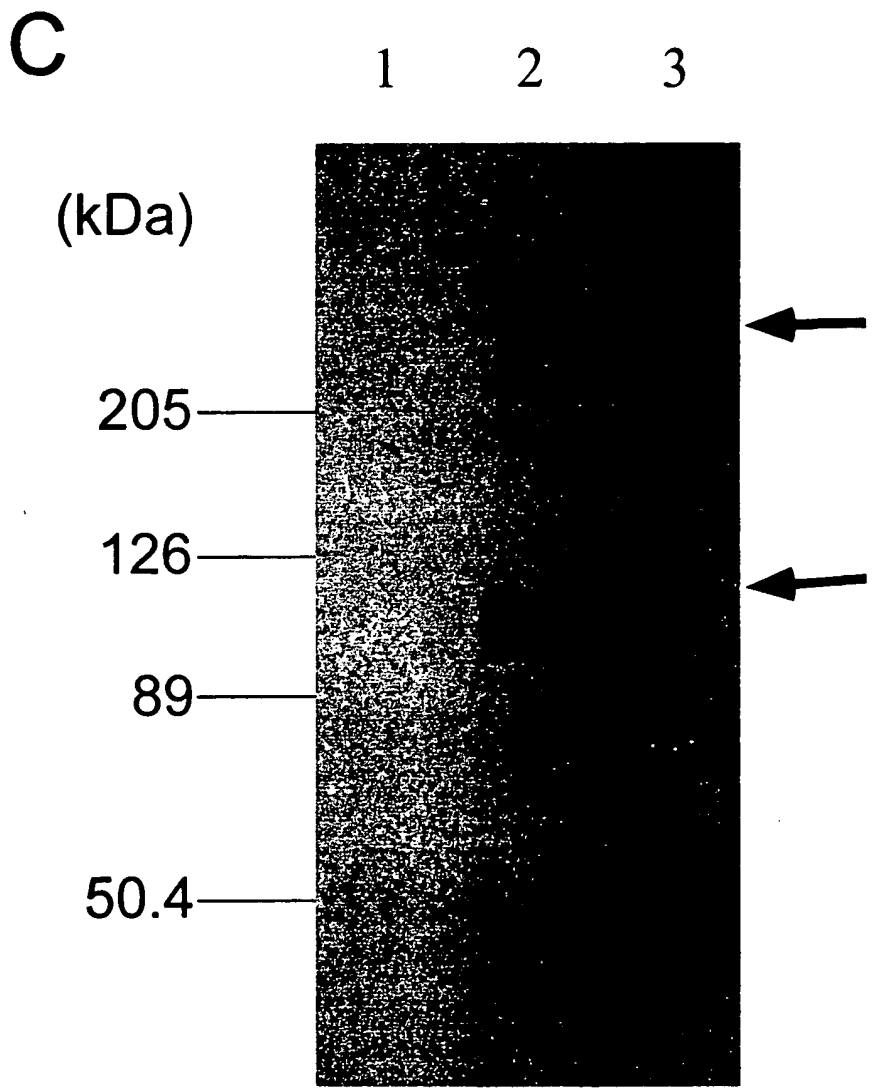

Fig. 7 alpha amino acid sequence

MERLWGLFQRAQQLSPRSSQTVYQRVEGPRKGHLEEEEEDGEEGAETLAHFCPMELRGPEPLGSRPRQPNLIPWAAAGRR
AAPYLVLTALLIFTGAFLLGYVAFRGSCQACGDSVLVVSEDVNYEPDLDFHQGRLYWSDLQAMFLQFLGEGRLEDTIRQT
SLRERVAGSAGMAALTQDIRAALSRQKLDHVWTDTHYVGLQFPDPAHPNTLHWVDEAGKVGEQLPLEDPDVYCPYSAIGN
VTGELVYAHYGRPEDLQDLRARGVDPVGRLLLVRVGVISFAQKVTNAQDFGAQGVLIYPEPADFSQDPPKPSLSSQQAVY
GHVHLGTGDPYTPGFPSFNQTQFPPVASSGLPSIPAQPISADIASRLLRKLKGPVAPQEWQGSLLGSPYHLGPGPRLRLV
VNNHRTSTPINNIFGCIEGRSEPDHYVVIGAQRDAWGPGAAKSAVGTAILLELVRTFSSMVSNGFRPRRSLLFISWDGGD
FGSVGSTEWLEGYLSVLHLKAVVYVSLDNAVLGDDKFHAKTSPLLTSLIESVLKQVDSPNHSGQTLYEQVVFTNPSWDAE
VIRPLPMDSSAYSFTAFVGVPAVEFSFMEDDQAYPFLHTKEDTYENLHKVLQGRLPAVAQAVAQLAGQLLIRLSHDRLLP
LDFGRYGDVVLRHIGNLNEFSGDLKARGLTLQWVYSARGDYIRAAEKLRQEIYSSEERDERLTRMYNVRIMRVEFYFLSQ
YVSPADSPFRHIFMGRGDHTLGALLDHLRLLRSNSSGTPGATSSTGFQESRFRRQLALLTWTLQGAANALSGDVWNIDNN
F

Fig. 8 alpha DNA sequence

CTGCAGGCTTCAGGAGGGGACACAAGCATGGAGCGGCTTTGGGGTCTATTCCAGAGAGcGCAACAACTGTCCCCAAGATC
CTCTCAGACCGTCTACCAGCGTGTGGAAGGCCCCCGGAAAGGGCACCTGGAGGAGGAAGAGGAAGACGGGGAGGAGGGGG
CGGAGACATTGGCCCACTTCTGCCCCATGGAGCTGAGGGGCCCTGAGCCCCTGGGCTCTAGACCCAGGCAGCCAAACCTC
ATTCCCTGGGCGGCAGCAGGACGGAGGGCTGCCCCCTACCTGGTCCTGACGGCCCTGCTGATCTTCACTGGGGCCTTCCT
ACTGGGCTACGTCGCCTTCCGAGGGTCCTGCCAGGCGTGCGGAGACTCTGTGTTGGTGGTCAGTGAGGATGTCAACTATG
AGCCTGACCTGGATTTCCACCAGGGcagactctactggaGcgacCtccaGgccatgttcctgcagttcctgggggaGggg
cgcctggaGgaCaccaTCAGGCAAACCAGCCTTCGGGAACGGGTGGCAGGCTCGGCCGGGATGGCCGCTCTGACTCAGGA
CATTCGCGCGGCGCTCTCCCGCCAGAAGCTGGACCACGTGTGGACCGACACGCACTACGTGGGGCTGCAATTCCCGGATC
CGGCTCACCCCAACACCCTGCACTGGGTCGATGAGGCCGGGAAGGTCGGAGAGCAGCTGCCGCTGGAGGACCCTGACGTC
TACTGCCCCTACAGcGCCATCGGCAACGTCACGGGAGAGCTGGTGTAcGCCCACTACGGGCGGCCCGAAGACCTGCAGGA
CcTGCGGGCCAGGGGCGTGGATCCAGTGGGCCGCCTGCTGCTGGTGCGCGTGGGGGTGATCagcTTCGCCCAGAAGGTGA
CCAATGCTCAGGACTTCGGGGCTCAAGGAGTGCTCATATACCCAGAGCCAGCGGACTTCTCCCAGGACCCACCCAAGCCA
AGCCTGTCCAGCCAGCAGGCAGTGTATGGACATGTGCACCTGGGAACTGGAgACCCcTACACACCTGGCTTCCCTTCCTT
CAATCAAACCCAGTTCCCTCCAGTTGCATCATCAGGCCTTCCCAGCATCCcAGCCCAGCCCATCAGTGCAGACATTGCCT
CCCGCCTGCTGAGGAAGCTCAAAGGCCCTGTGGCCCCCCAAGAATGGCAGGGGAGCCTCCTAGGCTCCCCTTATCACCTG
GGCCCCGGGCCACGACTGCGGCTAGTGGTCAACAATCACAGGACCTCCACCCCCATCAACAACATCTTCGGCTGCATCGA
AGGCCGCTCAGAGCCAGATCACTACGTTGTCATCGGGGCCCAGAGGGATGCATGGGGCCCAGGAGCAGCTAAATCCGCTG
TGGGGACGGCTATACTCCTGGAGCTGGTGCGGACCTTTTCCTCCATGGTGAGCAACGGCTTCCGGCCCCGCAGAAGTCTC
CTCTTCATCAGCTGGGACGGTGGTGACTTTGGAAGCGTGGGCTCCACGGAGTGGCTAGAAGGCTACCTCAGCGTGCTGCA
CCTCAAAGCCGTAGTGTACGTGAGCCTGGACAACGCAGTGCTGGGGGATGACAAGTTTCATGCCAAGACCAGCCCCCTTC
TGACAAGTCTCATTGAGAGTGTCCTGAAGCAGGTGGATTCTCCCAACCACAGTGGGCAGACTCTCTATGAACAGGTGGTG
TTCACCAATCCCAGCTGGGATGCTGAGGTGATCCGGCCCCTACCCATGGACAGCAGTGCCTATTCCTTCACGGCCTTTGT
GGGAGTCCCTGCCGTCGAGTTCTCCTTTATGGAGGACGACCAGGCCTACCCATTCCTGCACACAAAGGAGGACACTTATG
AGAACCTGCATAAGGTGCTGCAAGGCCGCCTGCCCGCCGTGGCCCAGGCCGTGGCCCAGCTCGCAGGGCAGCTCCTCATC
CGGCTCAGCCACGATCGCCTGCTGCCCCTCGACTTCGGCCGCTACGGGGACGTCGTCCTCAGGCACATCGGGAACCTCAA
CGAGTTCTCTGGGGACCTCAAGGCCCGCGGGCTGACCCTGCAGTGGGTGTACTCGGCGCGGGGGGACTACATCCGGGCGG
CGGAAAAGCTGCGGCAGGAGATCTACAGCTCGGAGGAGAGAGACGAGCGACTGACACGCATGTACAACGTGCGCATAATG
CGGGTGGAGTTCTACTTCCTTTCCCAGTACGTGTCGCCAGCCGACTCCCCGTTCCGCCACATCTTCATGGGCCGTGGAGA
CCACACGCTGGGCGCCCTGCTGGACCACCTGCGGCTGCTGCGCTCCAACAGCTCCGGGACCCCCGGGGCCACCTCCTCCA
CTGGCTTCCAGGAGAGCCGTTTCCGGCGTCAGCTAGCCCTGCTCACCTGGACGCTGCAAGGGGCAGCCAATGCGCTTAGC
GGGGATGTCTGGAACATTGATAACAACTTCTGAGGCCCTGGGGATCCTCACATCCCCGTCCCCCAGTCAAGAGCTCCTCT
GCTCCTCGCTTGAATGATTCAGGGTCAGGGAGGTGGCTCAGAGTCCACCTCTCATTGCTGATCAATTTCTCATTACCCCT
ACACATCTCTCCACGGAGCCCAGACCCCAGCACAGATATCCACACACCCCAGCCCTGCAGTGTAGCTGACCCTAATGTGA
CGGTCATACTGTCGGTTAATCAGAGAGTAGCATCCCTTCAATCACAGCCCCTTCCCCTTTCTGGGGTCCTCCATACCTAG
AGACCACTcTGGGAGGTTTGCTAGGCCCTGGGACCTGGCCAGCTCTGTTAGTGGGAGAGATCGCTGGCACCATAGCCTTA
TGGCCAACAGGTGGTcTGTGGTGAAAGGGGCGTGGAGTTTCAATATCAATAAACCACCTGATATCAATAAGCCAAAA

Fig. 9 beta DNA sequence

GCGTCCGCGGGGAGCGCTCTTTTCCTAAACTCAGGAACCCCTCGCCGCCCCTGCCCCTGGCGACCCCACGTCTCTGGCAT
CCTTCCCTCTTCCCTCCCTCTCCTCCGGGCGCCCAAAAAAGTCCCCACCTCTCCCCGCTTAGGCAAACCAGCCTTCGGGA
ACGGGTGGCAGGCTCGGCCGGGATGGCCGCTCTGACTCAGGACATTCGCGCGGCGCTCTCCCGCCAGAAGCTGGACCACG
TGTGGACCGACACGCACTACGTGGGGCTGCAATTCCCGGATCCGGCTCACCCCAACACCCTGCACTGGGTCGATGAGGCC
GGGAAGGTCGGAGAGCAGCTGCCGCTGGAGGACCCTGACGTCTACTGCCCCTACAGcGCCATCGGCAACGTCACGGGAGA
GCTGGTGTAcGCCCACTACGGGCGGCCCGAAGACCTGCAGGACcTGCGGGCCAGGGGCGTGGATCCAGTGGGCCGCCTGC
TGCTGGTGCCCGTGGGGGTGATCagcTTCGCCCAGAAGGTGACCAATGCTCAGGACTTCGGGGCTCAAGGAGTGCTCATA
TACCCAGAGCCAGCGGACTTCTCCCAGGACCCACCCAAGCCAAGCCTGTCCAGCCAGCAGGCAGTGTATGGACATGTGCA
CCTGGGAACTGGAgACCCcTACACACCTGGCTTCCCTTCCTTCAATCAAACCCAGTTCCCTCCAGTTGCATCATCAGGCC
TTCCCAGCATCCcAGCCCAGCCCATCAGTGCAGACATTGCCTCCCGCCTGCTGAGGAAGCTCAAAGGCCCTGTGGCCCCC
CAAGAATGGCAGGGGAGCCTCCTAGGCTCCCCTTATCACCTGGGCCCCGGGCCACGACTGCGGCTAGTGGTCAACAATCA
CAGGACCTCCACCCCCATCAACAACATCTTCGGCTGCATCGAAGGCCGCTCAGAGCCAGATCACTACGTTGTCATCGGGG
CCCAGAGGGATGCATGGGGCCCAGGAGCAGCTAAATCCGCTGTGGGGACGGCTATACTCCTGGAGCTGGTGCGGACCTTT
TCCTCCATGGTGAGCAACGGCTTCCGGCCCCGCAGAAGTCTCCTCTTCATCAGCTGGGACGGTGGTGACTTTGGAAGCGT
GGGCTCCACGGAGTGGCTAGAAGGCTACCTCAGCGTGCTGCACCTCAAAGCCGTAGTGTACGTGAGCCTGGACAACGCAG
TGCTGGGGGATGACAAGTTTCATGCCAAGACCAGCCCCCTTCTGACAAGTCTCATTGAGAGTGTCCTGAAGCAGGTGGAT
TCTCCCAACCACAGTGGGCAGACTCTCTATGAACAGGTGGTGTTCACCAATCCCAGCTGGGATGCTGAGGTGATCCGGCC
CCTACCCATGGACAGCAGTGCCTATTCCTTCACGGCCTTTGTGGGAGTCCCTGCCGTCGAGTTCTCCTTTATGGAGGACG
ACCAGGCCTACCCATTCCTGCACACAAAGGAGGACACTTATGAGAACCTGCATAAGGTGCTGCAAGGCCGCCTGCCCGCC
GTGGCCCAGGCCGTGGCCCAGCTCGCAGGGCAGCTCCTCATCCGGCTCAGCCACGATCGCCTGCTGCCCCTCGACTTCGG
CCGCTACGGGGACGTCGTCCTCAGGCACATCGGGAACCTCAACGAGTTCTCTGGGGACCTCAAGGCCCGCGGGCTGACCC
TGCAGTGGGTGTACTCGGCGCGGGGGGACTACATCCGGGCGGCGGAAAAGCTGCGGCAGGAGATCTACAGCTCGGAGGAG
AGAGACGAGCGACTGACACGCATGTACAACGTGCGCATAATGCGGGTGGAGTTCTACTTCCTTTCCCAGTACGTGTCGCC
AGCCGACTCCCCGTTCCGCCACATCTTCATGGGCCGTGGAGACCACACGCTGGGCGCCCTGCTGGACCACCTGCGGCTGC
TGCGCTCCAACAGCTCCGGGACCCCCGGGGCCACCTCCTCCACTGGCTTCCAGGAGAGCCGTTTCCGGCGTCAGCTAGCC
CTGCTCACCTGGACGCTGCAAGGGGCAGCCAATGCGCTTAGCGGGGATGTCTGGAACATTGATAACAACTTCTGAGGCCC
TGGGGATCCTCACATCCCCGTCCCCCAGTCAAGAGCTCCTCTGCTCCTCGCTTGAATGATTCAGGGTCAGGGAGGTGGCT
CAGAGTCCACCTCTCATTGCTGATCAATTTCTCATTACCCCTACACATCTCTCCACGGAGCCCAGACCCCAGCACAGATA
TCCACACACCCCAGCCCTGCAGTGTAGCTGACCCTAATGTGACGGTCATACTGTCGGTTAATCAGAGAGTAGCATCCCTT
CAATCACAGCCCCTTCCCCTTTCTGGGGTCCTCCATACCTAGAGACCACTcTGGGAGGTTTGCTAGGCCCTGGGACCTGG
CCAGCTCTGTTAGTGGGAGAGATCGCTGGCACCATAGCCTTATGGCCAACAGGTGGTcTGTGGTGAAAGGGGCGTGGAGT
TTCAATATCAATAAACCACCTGATATCAATAAGCCAAAA